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**APPENDIX A - Description of Potential Water Management Tools**

**APPENDIX B - Potential Implementation Schedule for Most Promising Tools**

# **CALFED Water Management Strategy**

## ***Stage 1 Tool Implementation Framework***

### **I. Introduction**

The CALFED Bay-Delta Program will complete its Record of Decision (ROD) by mid-2000. That ROD will reflect a 30-year horizon and a broad array of actions to restore the ecological health and improve water management for beneficial uses of the Bay-Delta system. As CALFED has prepared for long-term implementation, it has focused effort on prioritizing actions for Stage 1 -- the first seven years of the Program's implementation. Recent regulatory programs (e.g. ESA listings) and water management decisions (e.g. B2 implementation, pending Trinity River flow decision) continue the longstanding conflicts between water diversions and fish.

In this context, Governor Gray Davis and Department of the Interior Secretary Bruce Babbitt called on CALFED leaders and stakeholders to create a "framework" for implementing near-term actions that can reduce such resource conflicts in the Delta. Specifically, they called for frameworks for an environmental water account (EWA) and the integrated storage investigation (ISI). As CALFED moved forward on the EWA framework, it became clear that -- particularly in the near term -- enhancing water supply for the environment would draw on the same set of "tools," including near-term storage, as the agricultural and urban water users need for water supply reliability.

CALFED agencies therefore directed attention toward developing key water supply tools for both ecosystem and water supply reliability. CALFED and stakeholders began by identifying a list of tools that could be developed during Stage 1A (the first 2-3 years). Computer model runs showed the possible benefits from implementing those tools for ecosystem and/or water supply reliability purposes. Several operating policies were developed, which included a preliminary plan for sharing the costs and benefits of those tools. The goals of the sharing plan were to: 1) achieve a level of fishery protection that would lead to some level of assurance to water users, pursuant to the Endangered Species Act, that no additional water would be required for fishery needs; and 2) provide as much additional water supply reliability as reasonably possible. We also evaluated potential water quality impacts arising from implementation of tools modeled in the computer simulations.

This framework outlines how CALFED will begin implementing certain key water supply tools immediately after execution of the ROD. While some CALFED projects may require many years to accomplish, the ecosystem and water users cannot afford to wait 30 years for final implementation. CALFED is expected to achieve some progress on all of its goals during Stage 1. Near-term progress on these water management tools forms one of the cornerstones for CALFED's ultimate success. Section II describes these near-term tools and how they will be developed. Section III outlines the process for using the tools.

## A. Scope

This Tool Implementation Framework has objectives that mirror CALFED's Mission Statement and it applies the same solution principles. It seeks to improve – beyond existing regulatory conditions – both ecological health and water management for both the ecosystem and the water supply reliability. Because the most difficult conflicts between the ecosystem and the water users occur in the vicinity of the state and federal export facilities, the Tool Implementation Framework focuses the most attention on tools that will reduce these conflicts. While some of the tools lie upstream from the Delta, all the tools provide some relief from the conflicts arising out of Delta exports.

The tools were chosen so they could be used under a wide range of scenarios. While developing this Tool Implementation Framework, much discussion ensued about the baseline – i.e. the base conditions for water supply for water users and the environment from which proposed additions would be measured. The intense discussion reflected different methods of accounting for the water used for the various pre-implementation purposes. The conflict over baseline reflects a shortage of water for all Delta uses, making immediate implementation of these tools that much more critical. The conflict over the “baseline” indicates the urgency of reducing conflicts over the Delta's water.

One way of reducing such conflicts is to provide an endowment of water for fishery needs that allows regulatory agencies that implement the federal and state Endangered Species Acts to provide some assurance that no additional water will be required for fishery purposes. This endowment would work in concert with habitat restoration actions contained in CALFED's Ecosystem Restoration Program to place the Delta's threatened and endangered species on a trajectory toward recovery. At the time of the ROD, the California Department of Fish and Game, the United States Fish and Wildlife Service and the National Marine Fisheries Service intend to provide such assurances to the state and federal water projects when the ERP and the endowment described in this framework are formally established.

## B. Timeline

CALFED agencies will begin implementing identified tools immediately after executing the Record of Decision. Each tool has unique qualities that require different initial implementation steps and timeline. Some may provide immediate benefits. Others will require several years before benefits accrue. While the tools have been designed to minimize the need for additional legislative action, some may require additional appropriation or allocation of funds.

When will the final framework be decided? Work will continue on technical studies in early 2000, and additional work will be done with regard to economics, financing, etc. A final framework and implementation program will be included in the decision package that will accompany the Record of Decision.

## II. Tool Development

CALFED has been using the term “tools” to describe a lengthy list of operational innovations, water management coordination efforts, flexible regulatory approaches, and physical storage and conveyance improvements that may be put into place during Stage 1. Each tool has its own benefits and limitations. A detailed description of the potential tools is included in Appendix A of this Framework. The following summary provides the general categories of tools with promising examples of each.

CALFED is evaluating the possible benefits of each of these tools in the modeling or “gaming exercises.” Given the limitations of the simulation models and the simplifying assumptions used in the modeling, these gaming exercises offer only general guidance on the desirability of particular tools. In addition, each tool carries with it an institutional framework that may limit the tool’s usefulness or restrict its implementation. For example, CALFED has previously identified the potential benefits of new groundwater storage capacity in both the Sacramento and San Joaquin valleys. Initial gaming exercises have reconfirmed the benefits of groundwater storage in water management operations. Implementation of particular groundwater storage projects, however, raises significant issues of groundwater quality and quantity protection, as well as institutional issues such as ownership, control, and local vs. State regulation. In evaluating potential tools, CALFED has had to make preliminary assessments of implementability. In other words, how do we make the tools real?

In developing and implementing tools for an Environmental Water Account and for water supply enhancements, CALFED is mindful of its commitment for continuous improvement in water quality for in-Delta and export purposes. In the gaming exercises, expected effects of tool implementation on water quality are being evaluated to identify potential problems and opportunities. CALFED has previously identified a number of operational approaches and specific projects that could improve water quality. One example of an operational approach would be to establish a “Water Quality Account” (of water, money, or both) that could be managed in real-time to improve water quality. Specific projects are also under consideration. In the event that water quality problems are identified, CALFED will make a determination as to the proper response (including redesign of tools).

The following list of potential tools is divided into “Early Stage 1 Tools” (the first two or three years after the ROD) and “Later Stage 1 Tools” (the remainder of Stage 1). This division reflects CALFED’s assessment as to how quickly these particular tools can be made operational. More comprehensive descriptions of these tools including cost estimates, institutional issues and potential implementation time requirements are included in Appendix A.

### A. Early Stage 1 Tools

In the early years of Stage 1, CALFED will move forward with aggressive implementation of tools that have been used in the past on a temporary basis. These tools are described below. Other tools in the section dealing with water system improvements have been studied for many years and are already on a schedule for implementation early in Stage 1.

## 1. Managing the Existing System

In the last two or three years, conflicts over Delta diversions have forced CALFED agencies to turn to new water management approaches to balance environmental and water supply needs. Two tools in particular have offered substantial benefits in certain situations, and CALFED anticipates that these two tools will continue to be useful in the future, and particularly in Early Stage 1.

**Joint Point of Diversion.** CALFED envisions that exploiting the flexibility of using the "joint point of diversion" will be part of any Stage 1 water management plan. This concept allows the federal water project to use any available excess pumping capacity at the State's Banks Pumping Plant, or, conversely, allows the State Water Project to use excess pumping capacity at the federal Tracy pumping plant. In the past and in the current year, CALFED agencies have requested permission from the State Water Resources Control Board to use Joint Point of Diversion on a single-year basis. CALFED also anticipates that the State Board will make a final decision on ongoing use of Joint Point of Diversion when it issues its water rights decision in the near future.

Although the potential benefits of Joint Point of Diversion are substantial, they are also highly dependent on the particular hydrology of a given year. Further, conditions imposed on Joint Point of Diversion by the State Board or other regulatory agencies to mitigate possible water quality or fisheries impacts can also have an effect on the net benefits expected from Joint Point of Diversion.

**Source Shifting/Demand Shifting.** CALFED water management agencies have also found that voluntary shifts by water users in the timetable for water deliveries during the year, or temporary shifts by water users to non-project sources of supplies, have been extremely valuable in dealing with short term fluctuations in water supply availability. These approaches have been especially useful in addressing the so-called "low point" problem in the San Luis Reservoir (where reduced Delta pumping and increased demands combine to lower reservoir levels to a point where water quality problems occur). Issues associated with these "shifting" management techniques include compensating water users for extra costs incurred by the shift and allocating any increased risk caused by shifting.

## 2. Creating an Environmental Water Account

Many of the tools being considered for early Stage 1 explicitly address the question of creating an Environmental Water Account. A successful EWA would need to include a source of water supply as well as access to conveyance and storage. The tools described in Appendix A include several that use the same approach to creating an EWA: existing "excess" capacity at CVP, SWP and non-project storage and conveyance facilities would be "borrowed" by the EWA managers under a concept of "no harm" to existing users. Costs and priorities for use would need to be negotiated on a project-by-project basis. Similarly, the

EWA could acquire water and/or storage space at existing groundwater storage facilities.

This compensated use of "excess" capacity is far desirable to displacing existing users. Nevertheless, CALFED will still need to consider the effects of this EWA use on the emerging water transfer market, which also wants access to the excess capacity at existing storage and conveyance facilities. CALFED anticipates a serious dialog between the existing projects, the EWA managers, and the water transfers community early in Stage 1 to resolve potential conflicts.

### **3. Water for EWA and Water Supply Enhancement**

Another set of the Early Stage 1 Tools described in Appendix A are those that generate water supplies that could be used for either the EWA or for water supply enhancement. CALFED is aware that it is controversial to describe any tools as "generating water" or "creating new water." In effect, these tools only reallocate water from an existing consumptive or environmental beneficial use. CALFED emphasizes that it will be implementing these tools only to the extent that it can comply with existing laws protecting other water users and environmental values.

CALFED will need to make decisions about how the water supply benefits of these tools are allocated between an EWA and water users. This is discussed below in section III.

**Increased Banks Pumping.** Current regulatory agreements limit use of the State Water Project Banks pumping plant to 6,680 cfs for much of the year. CALFED is considering two alternatives for requesting higher Banks pumping during Early Stage 1. One alternative would increase the net allowable pumping by one third of the Vernalis inflow for the mid-December to mid-March time frame. The second alternative would increase pumping to 7,180 cfs between July 1 and September 30. These alternatives are described more fully in Appendix A. Any increase in pumping would require consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Game. In addition, the Corp of Engineers would need to issue a permit under Section 10 of the federal Rivers and Harbors Act.

**Flexible Export/Inflow (E/I) Ratio.** The 1995 Water Quality Control Plan and related ESA biological opinions all provide for the flexible application of the "E/I ratio" based on real-time evaluation of fishery conditions. Minor temporary adjustments to the E/I Ratio requirements can yield significant water supply benefits without adversely affecting environmental protection. CALFED intends to continue using this tool during Stage 1.

**Upstream Water Acquisitions.** In recent years, CALFED agencies have been able to coordinate upstream water acquisitions to meet environmental goals under the CVPIA Anadromous Fish Restoration Program (AFRP) with pumping plans in the Delta to achieve incidental water supply benefits. Although the purpose of

these water acquisitions must continue to be attaining high priority environmental needs identified in the AFRP or CALFED's ERP, CALFED believes that this coordinated approach for generating multiple benefits for water supply and the environment should be continued in Stage 1.

**Land Retirement.** CALFED has previously identified land retirement as a potential tool in addressing water quality impacts in drainage impacts lands. The U.S. Bureau of Reclamation has initiated a land retirement program under the authority of the CVPIA. Although the primary purpose of a land retirement program is to achieve water quality goals, the program has associated water supply reliability benefits. Depending on how the program is structured, those water supply benefits can accrue to the water district containing the retired lands, or could become more generally available for other consumptive or environmental uses.

#### **4. Water System Improvements**

Given the longer lead time for construction projects generally, there are only a limited number of water system improvements that could be brought on-line during Early Stage 1. These include:

**Intertie between State's California Aqueduct and Federal Delta-Mendota Canal.** One possible conveyance improvement is an intertie between the two project conveyance canals leading south from the pumps. The principal advantage of an intertie is to allow the federal project to use its entire 4600 cfs pumping capacity during pumping windows.

**South Delta Improvements.** CALFED has identified the South Delta Program as a high priority for implementation during Early Stage 1. Many of the conveyance and channel improvements in the South Delta Program will enhance water supply capabilities at the state and federal pumps.

#### **B. Late Stage 1 Tools**

In the later years of Stage 1, CALFED will continue to implement the Early Stage 1 tools as appropriate. In addition, larger scale projects with longer start-up periods should be coming on line. Gaming exercises suggest that these additional tools could yield substantial benefits for both water supply and environmental protection by the end of Stage 1. The additional tools anticipated for Late Stage 1 are described below.

##### **1. Banks Pumping**

CALFED believes that one of its major challenges during Stage 1 will be to develop the operational and regulatory rules and physical facilities necessary to take advantage of the full 10,300 cfs pumping capacity at the State's Banks Pumping Plant.

## **2. System Improvements**

**New Surface Storage.** CALFED has identified a number of potential surface storage projects that could conceivably be brought on line by the end of Stage 1. These include a variety of configurations for in-Delta storage (Webb Tract, Bacon Island, Woodward Island, and Victoria Island), as well as a small increase (6 feet) in the height of the CVP's Shasta Dam. Substantial technical and institutional work remains to be done before these projects could be constructed and operated, and the CALFED Integrated Storage Initiative (ISI) is taking the lead on programmatic evaluation of these projects.

**New Groundwater Storage.** As noted above, gaming exercises have shown considerable benefits from increased groundwater storage capabilities. In the ISI, CALFED is evaluating several proposed groundwater storage projects throughout the Central Valley. These include southern Sacramento County, East San Joaquin Basin, Gravelly Ford, Madera Ranch and Central West Basin. In each case, CALFED is depending heavily on local partners to address the many local and regional issues associated with groundwater projects.

## **3. Efficiency Investments**

Through its Water Use Efficiency Program, CALFED anticipates significant water supply benefits from investment in water use efficiency measures throughout the State. By coupling efficiency investments with transfer of conserved water, CALFED could apply these water savings to other environmental or water supply uses. Alternatively, the savings could be retained by the water users to improve their water supply reliability.

## **4. Flexible Standards**

Although CALFED is not proposing specific changes to standards in the Clean Water Act or Endangered Species Act regulatory programs, both statutes include provisions for revising regulations in response to new information. During Stage 1, CALFED and the applicable regulatory agencies will evaluate opportunities to revise these regulatory programs to achieve greater flexibility and enhanced environmental protection.

# **III. Evaluating Tools in Gaming Exercises**

Generally, once each tool has been created, it will be distributed to one or more agencies that will have the right to exercise that tool. The recipient(s) of each tool will be identified as part of the Record of Decision. The distribution of the tools reflects the effectiveness of each tool in serving either an ecological or water supply reliability purpose. In some circumstances, it is possible that water developed by a particular tool could be used for different purposes at different times. In those cases, the ROD will identify the mechanisms for managing that tool.

Clear objectives for operation of the tools will be needed for their implementation. Such objectives have not yet been developed and agreed to. Listed below are the ecological and water



supply objectives used in the computer gaming studies to date. The final objectives will be included as part of the ROD.

### **A. Objectives For Tool Operation**

Determining how each tool satisfied an ecological purpose and/or a water supply reliability purpose started with establishing objectives for each purpose. The objectives were drawn from the ecological or water supply needs after considering existing regulatory standards. Neither set of needs was quantified, but each need was described based on a number of factors: timing, quality, and flow. The ecological objectives were based on fishery needs, particularly relating to export pumping. The water supply needs were based on maximizing south-of-Delta deliveries, up to the existing contracted amounts.

**Ecological Objectives.** The ecological objectives were derived from the fishery research and analysis completed by CALFED fishery agencies – California Department of Fish & Game, U.S. Fish & Wildlife Service, and the National Marine Fisheries Service. This research and analysis was completed as part of several different programs, both inside and outside of CALFED.

Through the Diversion Effects on Fishery Team (DEFT), the fishery agencies identified a series of actions that would best promote fishery survival. Those actions include:

[insert bullet list of actions]

Biological uncertainty makes it impossible to predict accurately the effects on fishery population arising out of the fishery actions. The annual abundance fluctuations of fish species currently listed as threatened or endangered can reflect only long-term trends of decline or recovery. Taking one positive fishery action in one year will provide some level of benefit to fishery resources, but the magnitude of the effect remains uncertain.

**Water Supply Objectives.** With the ecological objectives focused on minimizing fishery impacts from export pumping, the water supply objective provided the converse perspective: maximizing export deliveries. Without trying to determine the precise deficit of contract deliveries that export interests suffer, a clear and substantial need for water south of the Delta to improve reliability of those deliveries was identified. The actual amount of water that will be needed in any one year will depend on a number of factors, particularly the cost and the willingness of export interests to pay the costs of the tools.

Just as fishery population effects cannot be estimated accurately, the economic effects of greater or more reliable water exports cannot be estimated accurately. Cropping patterns, rainfall and availability of alternative water supplies fluctuate annually. Moreover, irrigation in some export areas may cause non-point source agricultural runoff of salts, with polluted waters draining back to the Delta. The economic costs of mitigating such pollution may be substantial and cannot be quantified.

## **B. Summary of Gaming Results**

CALFED has achieved substantial progress in analyzing the effectiveness of each tool in serving an ecological or water supply reliability purpose. CALFED agency staff, working with stakeholder technical representatives, modeled each tool applying a variety of assumptions as to existing conditions. Applying the hydrology of several years, the modelers estimated the extent that the fishery objectives could be implemented. The modelers then estimated, after employing each tool, the extent of fish entrained at the export pumps, which provided some indication of fishery survival, and the amount of additional water that could be exported south.

[insert paragraphs summarizing results of modeling]

## **IV. Managing the Tools**

### **A. Preliminary Distribution of Water Tools & Assets**

As stated earlier, the final distribution of water tools and their benefits will be made as part of the Record of Decision. CALFED will develop by February 2000 a straw proposal for discussion among CALFED agencies and stakeholders. The subsequent discussions and possible additional studies will provide guidance for the final plan.

### **B. Use of the Benefits Derived from Tools**

Once a tool has been acquired, control of its use will be transferred to the decisionmaker for that tool. The water derived from implementing the tool may be used flexibly for a myriad of purposes other than those that exist at the time of the ROD.

- The tools distributed to ecosystem needs therefore may be used for any additional fishery actions, other than the 1995 Delta Water Quality Control Plan, its predecessors, then-existing biological opinions or actions taken pursuant to (b)(2).
- The tools distributed to water supply reliability may be used for state or federal water project contractors in times when ordinary operations cannot provide full contract entitlements. Regardless of the beneficiary of the tools, important issues need to be addressed including who pays.

### **C. Operational Decisions**

*Decisions as to whether particular assets are used in any particular year for ecological or water supply purposes will be made based on criteria established in the Record of Decision. The first decision as to distribution will be made in the Record of Decision. The intended purpose will have first priority for using the asset. If it is not needed, then the asset will be available for the other purpose, if there is funding to pay for employing the asset.*

*Assets distributed to ecological purposes will be used if the asset will help fulfill: a) fishery objectives; b) restoration of ecological processes in the Delta; c) fishery*

*experimental needs; or d) any other fishery need that research shows will help promote a healthy fishery.*

*Assets distributed to water supply reliability purposes will be provided to export interests in any year that exporters are willing to pay the cost of implementing the tool required to receive the asset. [WHAT ELSE?] The Bureau of Reclamation and the Department of Water Resources will determine whether the conditions have been satisfied for employing a water supply reliability tool.*

*Accounting for the water will be performed by . . . Accounting will [explain process]*

*(This section needs to be revised to separately address governance and administration, assurances, and finance. An introduction to an assurance section follows)*

There will be some risk taken by all interests that measures implemented during Stage 1 will succeed in meeting objectives. Examples include ecosystem restoration / rehabilitation measures, water quality programs and conveyance improvements. It is clear that the actual success of such measures will need to be gauged by the end of Stage 1 in order to provide a practical framework for subsequent implementation programs. Questions that stakeholders will ask include:

- What happens if fish populations do not rebound as a result of ecosystem improvements?
- What happens if there are no substantial water quality improvements during Stage 1?
- What happens if the promises of increased water supply reliability from a number of costly projects and programs does not come to pass?